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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,115	07/14/2003	Michael Powers	MKPA-105US	6849

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EXAMINER
SONG, SARAH U

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/619,115	POWERS, MICHAEL	
	Examiner	Art Unit	
	Sarah Song	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2 and 7-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2 and 7-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's communication filed on June 2, 2005 has been carefully considered and placed of record in the file. Claims 2, 7, 8 and 24 have been amended. Claims 1 and 3-6 have been canceled. Claims 2 and 7-26 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Ahn et al. (U.S. Patent 5,570,385 previously relied upon).**

4. Regarding claim 13, Ahn et al. discloses an optical component comprising:

- a substrate 10 formed from a semiconductor of a first conductivity type and having an optical component region (defined by width L) and a substantially planar fiber mount region adjacent to the optical component region;
- an active layer 60b selected from a group consisting of a bulk gain material and a quantum well structure formed on the substrate over the optical component region;
- a semiconductor layer 60c of a second conductivity type different from the substrate, the semiconductor layer formed over the active layer 60b;
- an electrode layer 70 of a high conductivity material formed over the semiconductor layer; and

- an optical output coupler (end facet of laser) formed on a surface of the active layer to provide radiation emitted from the active layer. See Figures 6i and 7e.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 2, 7-12 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zairi et al. (U.S. Patent Application Publication 2003/0108304 previously relied upon) in view of Koh et al. (U.S. Patent 6,628,854 newly cited).**

7. Regarding claim 7, Zairi et al. discloses an optical component housing 90 comprising a substrate 92 having a substantially planar fiber mount region 94 and an optical component mount region adjacent to the substantially planar fiber mount region. See Figure 7A.

8. Regarding claims 7 and 8, Zairi et al. discloses an optical component housing 90 comprising a substrate 92, and a substantially planar fiber mount region 94 formed on the substrate and adjacent to an optical component mount region, but does not expressly disclose an optical component mount aperture formed in the substrate and configured to receive an optical component therein, an optical component placed within the aperture. See Figure 7A.

9. Koh et al. discloses an optical component mount apertures 7a, 8a, 9a and 10a in an optical device substrate for providing ease of alignment. The component mount aperture is configured to receive an optical component. See Figures 2, 4 and related text.

10. Zairi et al. and Koh et al. are analogous art as pertaining to optical device substrates. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an optical component mount aperture, and the optical component 95 of Zairi et al. placed within the aperture in order to provide ease and accuracy of alignment.

11. Regarding claim 2, Zairi et al. does not expressly disclose a substrate 92 to be selected from a group consisting of an aluminum oxide ceramic, a nickel-cobalt alloy, aluminum nitride ceramic, or silicon carbide ceramic. However, Zairi et al. discloses that the substrate may be selected from any suitable material. Aluminum oxide ceramics are well known in the art for optical device substrates and for being easily machined. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an aluminum oxide ceramic substrate in order to provide ease of manufacture.

12. Regarding claims 9 and 10, Zairi et al. discloses an optical component housing further comprising a metallic mount pad 96 formed over the substantially planar fiber mount region and configured to bond to a metal solder. Zairi et al. discloses the housing further comprising a metallized optical fiber 102 coupled to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036].

13. Regarding claims 11 and 12, Zairi et al. does not expressly disclose the fiber mount pad to be configured to bond to a glass solder. Zairi et al. does disclose that the fiber 102 may be bare, but also does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of

manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

14. Regarding claim 24, Zairi et al. discloses a high thermal conductivity base 92, a low thermal conductivity substrate 94 having a substantially planar fiber mount region therein and abutting the high thermal conductivity base with a surface at the same level as the base; and an unpackaged optical component 95 mounted on the base.

15. Zairi et al. does not expressly disclose the optical component having a top surface metallized to serve as an electrode, and an aperture in which the component is mounted.

16. Koh et al. discloses an aperture 7a, 8a, 9a or 10a in which to mount the component to provide ease of alignment.

17. Furthermore, metallized top surfaces of optical components are well known in the art for facilitating electrical connections between the device and the electrical circuitry.

18. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a metallized top surface of the device 95 of Zairi et al. mounted in an aperture, in order to accommodate the electrodes of the device and to provide ease and accuracy of electrical connections and alignment.

19. Regarding claim 25, Zairi et al. discloses an optical component housing further comprising a metallic mount pad 96 formed over the substantially planar fiber mount region and configured to bond to a metal solder. Zairi et al. discloses the housing further comprising a

metallized optical fiber 102 coupled to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036].

20. Regarding claim 26, Zairi et al. does not expressly disclose the fiber mount pad to be configured to bond to a glass solder. Zairi et al. does disclose that the fiber 102 may be bare, but also does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

21. **Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zairi et al. (U.S. Patent Application Publication 2003/0108304 previously relied upon) in view of Tombling et al. (U.S. Patent 6,728,450 previously relied upon).**

22. Regarding claim 18, Zairi et al. discloses a method of forming a fiber-coupled component housing comprising the steps of: forming a substrate 92, forming a substantially planar fiber mount region 94 and an optical component mount region adjacent to the substantially planar fiber mount region. See Figure 7A.

23. Zairi et al. does not expressly disclose a ceramic substrate, an optical component mountable aperture formed in the substrate, and an optical component placed within the area defined by the optical component mountable aperture. See Figure 7A.

24. Tombling et al. discloses an optical component mount apertures 52 in an optical device substrate and placing an optical component within an area defined by the optical component mount aperture for providing ease of alignment. The component mount aperture is configured to receive an optical component.

25. Zairi et al. and Tombling et al. are analogous art as pertaining to optical device substrates. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an optical component mount aperture, and the optical component 95 of Zairi et al. placed within an area defined by the aperture in order to provide ease and accuracy of alignment. See Paragraph spanning columns 5 and 6.

26. Zairi et al. also does not expressly disclose a substrate 92 to be ceramic. However, Zairi et al. discloses that the substrate may be selected from any suitable material. Aluminum oxide ceramics are well known in the art for optical device substrates and for being easily machined. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an aluminum oxide ceramic substrate in order to provide ease of manufacture.

27. Regarding claim 19, Zairi et al. discloses the method further comprising forming a metallic mount pad 96 over the substantially planar fiber mount region and configuring said mount pad to bond to a metal solder. Zairi et al. discloses the method further comprising securing a metallized optical fiber 102 to the metallic mount pad 96 by the metal solder 100 to optically couple the fiber and the optical component. See Paragraphs [0028], [0030] and [0036].

28. Regarding claim 20, Zairi et al. discloses a forming a fiber mount pad 96 over the substantially planar fiber mount region, but does not expressly disclose the fiber mount pad to be

configured to bond to a glass solder. Zairi et al. does disclose that the fiber 102 may be bare, but also does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

29. **Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn et al. as applied to claim 13 above, and further in view of Zairi et al. as previously relied upon.**

30. Regarding claims 14-17, Ahn et al. does not expressly a mount pad over the planar fiber mount region, a metal solder, or a glass solder.

31. Zairi et al. discloses an optical component housing further comprising a metallic mount pad 96 formed over the substantially planar fiber mount region and configured to bond to a metal solder. Zairi et al. discloses the housing further comprising a metallized optical fiber 102 coupled to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036]. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the mount pad and metal solder as disclosed by Zairi et al. in order to provide a rugged assembly with an optical fiber.

32. Furthermore, Zairi et al. discloses that the fiber 102 may be bare, but also does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are

well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

33. **Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn et al. in view of Doussiere et al. (U.S. patent 5,717,711 previously relied upon).**

34. Regarding claim 21, Ahn et al. discloses a method of forming a fiber-coupled optical component comprising the steps of:

- forming a substrate 10 from a III/V semiconductor material of a first conductivity type;
- forming an active layer 60b selected from a group consisting of a bulk gain material and a quantum well structure, the active layer being formed over a portion of the substrate;
- forming a semiconductor layer 60c over the active layer from a III/V material of a second conductivity type different from the substrate;
- forming an electrode layer 70 over the semiconductor layer from a high conductivity material; and
- forming a substantially planar fiber mount region on a surface of the substrate and adjacent to an optical output coupler.

See Figures 6i and 7e.

35. Ahn et al. does not expressly disclose an anti-reflective optical output coupler on a face of the active layer.

36. Doussiere et al. discloses a fiber-laser coupler wherein a substantially anti-reflective optical output coupler is formed on a face F1 of the active layer. See column 3, lines 14-15. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form a substantially anti-reflective optical output coupler on a face of the active layer of Ahn et al. in order to promote emissions from the desired facet of the semiconductor laser.

37. **Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn et al. in view of Doussiere et al. as applied to claim 21 above, and further in view of Zairi et al.**

38. Regarding claims 22 and 23, Ahn et al. does not expressly disclose the steps of forming a metallic or fiber mount pad over the planar fiber mount region and securing a metallized or bare fiber to the metallic or fiber mount pad by a metal solder or a glass solder.

39. Zairi et al. discloses the steps of forming a metallic mount pad 96 over the substantially planar fiber mount region. Zairi et al. further discloses securing a metallized optical fiber 102 to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036]. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the metallic mount pad and secure a metallized fiber by a metal solder as disclosed by Zairi et al. in order to provide a rugged assembly with an optical fiber.

40. Furthermore, Zairi et al. discloses that the fiber 102 may be bare, but also does not expressly disclose the step of securing the fiber to the fiber mount pad by a glass solder. Glass

solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to secure a fiber by a glass solder in order to provide ease of manufacture for a fiber-coupled device. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the glass solder and the substrate.

Response to Arguments

41. Applicant's arguments with regard to claims 2, 7-12 and 24-26 submitted June 2, 2005 have been considered but are moot in view of the new ground(s) of rejection.

42. Regarding claims 13 and 21-23, Applicant states that Ahn discloses a U-shaped guide region and not a substantially planar region. Examiner agrees that Ahn discloses a U-shaped guide region. However, Ahn also discloses the substrate comprising a substantially planar fiber mount region (region surrounded by the U-shaped guide) and thus meets the limitations of claim 13. Examiner has not relied solely on Figure 7i. However, Figure 7i clearly shows the fiber mount region of the substrate to be planar.

43. Regarding claims 14-17, Applicant states that the proposed modification or combination would change the principle of operation of Ahn et al. Examiner respectfully disagrees. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Zairi et al. is relied upon to disclose known means of

mounting the fiber to the optical component substrate. Furthermore, Applicant relies upon column 3, lines 8-15 of Ahn et al. to support the arguments. However, it is noted that column 3, lines 8-15 of Ahn et al. is pertinent to the discussion of the prior art of Ahn et al., and not to the actual device of Ahn et al.

Conclusion

44. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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